

I Claim:

1. A cleaning device comprising:
 - a. an elongated flexible base member formed in a helix-like configuration forming an opening therethrough and formed from a thermoplastic material having fibers protruding from at least one side of a portion thereof and said base member having a characteristic permitting memory reset from a first configuration to a second configuration.
2. A method for forming a cleaning device which comprises the steps of:
 - a. selecting an elongated flexible base member formed from a thermoplastic material having a plurality of memory states and having a plurality of fibers integrally connected to and protruding from at least one side of a portion thereof;
 - b. bending said base member having a first memory state from a first position to a second position;
 - c. applying heat to said base member to reset said first memory state to a second memory state.
3. A cleaning device as described in claim 3 wherein:
 - a. said base member has an elongated helix configuration.
4. A cleaning device as described in claim 3 wherein:
 - a. said base member has an elongated helix-like configuration having a constant helical angle.
5. A cleaning device as described in claim 3 wherein:
 - a. said base member has an elongated helix-like configuration having a varying helical angle.
6. A cleaning device as described in claim 3 wherein:

a. said base member has an elongated helix-like configuration having a selected helical angle which forms a device with coils which are close fitting one to the other.

7. A cleaning device as described in claim 3 wherein:

a. said base member has an elongated helix-like configuration having a selected helical angle which forms a device with coils which are spaced one from the other a selected distance.

8. A cleaning device as described in claim 3 wherein:

a. said fibers protrude from said base at varying selected lengths from said base.

9. A cleaning device as described in claim 3 wherein:

- a. said base member has a helix configuration; and
- b. said base member has a constant helical angle.

10. A cleaning device as described in claim 3 wherein:

a. said base member has an elongated helix-like configuration having varying selected helical angles.

11. A cleaning device as described in claim 3 wherein:

a. said thermoplastic base member is a spring memory return material.

12. A method for forming a cleaning device which comprises the steps of:

- a. selecting an elongated base member formed from a thermoplastic material and having a plurality of fibers integrally connected thereto and protruding therefrom;
- b. attaching a first portion of said base member to a rotatable mandrel member at a starting point on said mandrel;

c. simultaneously rotating said mandrel, and progressively feeding said base member onto said mandrel at an ever increasing distance from said starting point on said mandrel;

d. applying sufficient heat to said base member to soften said thermoplastic material so that it will conform to the outer surface of said mandrel;

e. continuing said rotating and feeding until a selected end point away from said starting point on said mandrel is reached;

f. applying a cooling medium to said base member until said base member hardens and remains conformed to the outer surface of said mandrel; and

g. removing said base member from said mandrel.

13. A method for forming a cleaning device wherein the steps described in claim 12 include:

a. selecting a base member wherein the fibers protrude from one side only of said elongated base member; and

b. feeding said base member onto said mandrel as described in claim 13 so that said base member is fed onto the outer surface of said mandrel so that said fibers protrude radially outwardly from said mandrel.

14. A method for forming a cleaning device wherein the steps of claim 13 include:

a. selecting a base member wherein the fibers protrude from one side only of said elongated base member;

b. selecting a mandrel having a tubular configuration;

c. feeding said base member into the tubular interior of said mandrel so that said fibers protrude radially inwardly from said mandrel circumference.

15. A method for forming a cleaning device wherein the steps of claim 13 include:

a. applying said sufficient heat to said base member prior to said feeding step.

16. A method for forming a cleaning device using the steps of claim 13 and further comprising the steps of:

a. severing said base member at a point at a selected distance from the last portion to be fed upon said mandrel thus providing a leader member.

17. A method for forming a cleaning device using the steps of claim 13 and further comprising the steps of:

a. providing a guide for said base member directing said base member toward said mandrel at a selected angle.

18. A method for forming a cleaning device using the steps of claim 13 and further comprising the steps of:

a. providing a carriage means for carrying a guide for said base member which is movable at a selected velocity parallel to said mandrel during said feeding step.

19. A method for forming a cleaning device using the steps of claim 18 and further comprising the steps of:

a. selecting a speed controller for varying the velocity of said carriage during said feeding step.

20. A method for forming a cleaning device using the steps of claim 19 and further comprising the steps of:

a. selecting an angle controller for varying the angle of said guide member for varying the angle said base member is directed toward said mandrel.

21. A method for forming a cleaning device using the steps of claim 19 and further comprising the step of varying the angle of said guide member during said feeding step.

22. A method for forming a cleaning device using the steps of claim 17 and further comprising the step of:

- a. severing the fiber members from said leader member.

23 A method for forming a cleaning device using the steps of claim 13 and further comprising the steps of:

- a. providing a tail portion before attaching said base member to said rotatable mandrel member; and
- b. severing the fiber members from said tail member.

24. A method for forming a cleaning device using the steps of claim 13 wherein:

- a. the base member selected has one or more types of fibers integrally connected thereto in patterns of uniformly mixed distribution or patterns of segregated patterns of different fibers.

25. A cleaning device as described in claim 1 comprising:

- a. a first portion of said elongated flexible base member forming a first end is formed without said helix-like configuration and without said fibers thereby creating a first leader.

26. A cleaning device as described in claim 25 comprising:

- a. a second portion of said elongated flexible base member forming a second end is formed without said helix-like configuration and without said fibers creating a second leader.

27. A cleaning device as described in claim 1 comprising:

- a. a non-stretchable and relatively non-compressible plastic core member inserted through a portion of said opening formed by said elongated flexible base member and connected to said base member at one or more points along the length of said flexible base member.

28. A cleaning device as described in claim 27 comprising:

a. said flexible base member is connected to said core member at the end portions only of said flexible base member ,

29. A cleaning device as described in claim 27 comprising:

a. said flexible base member is connected substantially continuously to said core member throughout said portion which is formed in a helix-like configuration.

30. A cleaning device as described in claim 27 comprising:

a. a first core extension extending beyond a first end of said flexible base member forming a first handle.

31. A cleaning device as described in claim 30 comprising:

a. a second core extension extending beyond a second end of said flexible base member forming a second handle.

32. A cleaning device as described in claim 27 comprising:

a. said core member is shaped and dimensioned to permit said device to be inserted through elongated enclosures without buckling.

33. A cleaning device as described in claim 27 comprising:

a. said core member is shaped and dimensioned to permit said device to be pulled through elongated tortuous enclosures.

34. A cleaning device as described in claim 32 comprising:

a. said fibers are of sufficient density and length to permit said cleaning device to be forced through a structure to be inserted through a tubular structure by fluid pressure.

35. A cleaning device as described in claim 27 comprising:

a. said fibers protruding from said base member have a relatively short length to enable said device to be inserted through tubular members having a relatively small cross section.

37. A cleaning device as described in claim 27 comprising:

a. said fibers protruding from said base member have a relatively long length to enable said device to be inserted through tubular members having a relatively large cross section.

38. A cleaning device as described in claim 27 comprising:

a. said fibers protruding from said base member are relatively rigid to enable forceful cleaning of tubular and non tubular work pieces.

39. A cleaning device as described in claim 27 comprising:

a. said fibers protruding from said base member are relatively flexible to enable said device to clean irregularly dimensioned tubular and non-tubular members more effectively or to avoid scratching certain surfaces. .